WHAT IS CLAIMED IS:

1. A process for reducing a level of H_2O in a halogen-containing fluid comprising:

exposing the halogen-containing fluid to a fluorine-containing material, wherein during exposing, the fluorine-containing material changes from a first composition to a second composition; and

flowing the halogen-containing fluid to a reactor after exposing the halogen-containing fluid to the fluorine-containing material.

2. The process of claim 1, wherein:

the first composition comprises a metal-fluorine compound;

the second composition comprises a hydrate of the metal-fluorine compound;

the halogen-containing fluid comprises HF; and

the reactor comprises an electrolytic cell.

3. The process of claim 1, wherein the material:

is not substantially soluble in the presence of the halogen-containing fluid;

is capable of being regenerated from the second composition to the first composition; and

has a particle size in a range of approximately 1.5-4.5 mm.

4. The process of claim 1, further comprising regenerating the material from the second composition to the first composition, wherein exposing and regenerating are performed while the material lies within a same container.

5. The process of claim 1, wherein:
the halogen-containing fluid comprises HF;
the first composition of the material is CoF_2;
the second composition comprises a hydrate of CoF_2; and
the reactor comprises an electrolytic cell that is designed to generate F_2 from HF.

6. The process of claim 1, further comprising monitoring a conductivity of the halogen-containing fluid after exposing the halogen-containing fluid to the fluorine-containing material.

7. The process of claim 1, further comprising placing the halogen-containing material in a storage container after exposing the halogen-containing fluid to a fluorine-containing material and before flowing the halogen-containing fluid to a reactor.

8. The process of claim 1, wherein the reactor is a lithium ion battery.

9. A process for reducing a level of an inorganic, polar, hydrogen-containing impurity from a process fluid comprising:

exposing the process fluid to a solid fluorine-containing material, wherein:

during exposing, the fluorine-containing material changes from a first composition to a second composition that is a complex of the first composition; and

a ligand of the complex comprises the impurity as a coordinating group;

flowing the process fluid to equipment having sensitivity to the inorganic, polar, hydrogen-containing impurity after exposing the process fluid to the fluorine-containing material.

10. The process of claim 9, wherein:

the first composition comprises a metal-fluorine compound; and

the impurity comprises H_2O or NH_3.

11. The process of claim 9, wherein the material:

is not substantially soluble in the presence of the process fluid;

is capable of being regenerated from the second composition to the first composition; and

has a particle size in a range of approximately 1.5-4.5 mm.

12. The process of claim 9, further comprising regenerating the material from the second composition to the first composition, wherein exposing and regenerating are performed while the material lies within a same container.

13. The process of claim 9, wherein:
the process fluid comprises HF;
the first composition of the material is CoF_2;
the second composition comprises a hydrate of CoF_2; and
the reactor comprises an electrolytic cell.

14. The process of claim 9, further comprising monitoring a conductivity of the fluorine-containing fluid after exposing the fluorine-containing fluid to the fluorine-containing material.

15. The process of claim 9, wherein after exposing, the concentration of the H_2O within the process fluid is no greater than approximately 10 parts per million.

16. An impurity gettering device comprising:
a container having an inlet and an outlet; and
a first material comprising a first metal fluoride capable of forming a first metal fluoride complex, wherein the first material lies within the container and configured such that a fluid passes through the inlet and the first material before reaching the outlet.

17. The impurity gettering device of claim 16, wherein the first metal comprises cobalt.

18. The impurity gettering device of claim 16, further comprising a second material and a retainer, wherein:
the retainer lies between the first and second materials;
the second material lies between the retainer and the outlet; and
the second material is capable of changing color when exposed to an impurity that the impurity gettering device is designed to getter.

19. The impurity gettering device of claim 16, wherein the container comprises at least 70 weight percent of nickel, copper, or a combination of nickel and copper.

20. The impurity gettering device of claim 16, wherein at least a portion of the container is optically transparent or translucent.

21. A processing system comprising:

an impurity gettering device coupled to a fluid source,

wherein the impurity getting device comprises:

a container having an inlet and an outlet; and

a first material comprising a first metal fluoride capable of forming a first metal fluoride complex, wherein the material lies within the container and configured such that a fluid passes through the inlet and the material before reaching the outlet; and

a first reactor coupled to the impurity gettering device.

22. The processing system of claim 21, wherein the first metal comprises cobalt.

23. The processing system of claim 21, wherein the impurity getting device further comprises a second material and a retainer, wherein:

the retainer lies between the first and second materials;

the second material lies between the retainer and the outlet; and

the second material is capable of changing color when exposed to an impurity that the impurity gettering device is designed to getter.

24. The processing system of claim 21, wherein the container comprises at least 70 weight percent of nickel, copper, or a combination of nickel and copper.

25. The processing system of claim 21, wherein at least a portion of the container is optically transparent or translucent.

26. The processing system of claim 21, wherein the first reactor comprises an electrolytic cell.

27. The processing system of claim 21, further comprising a second reactor coupled to the first reactor, wherein:
the first reactor comprises a plasma generator; and
the second reactor comprises a semiconductor fabrication tool.

28. The processing system of claim 21, wherein the first reactor comprises a deposition chamber.